

Applicant Muntermann
Attorney Docket (H)02MUN0018USP
US Application 10/049,934

In the Claims:

1. (Currently Amended) Catheter for the ablation of biological, in particular of animal or human, tissue, including preferably for the ablation of human myocardial tissue, having said catheter comprising:

at least one ablation or mapping electrode,

~~characterized in that~~ wherein the at least one ablation or mapping electrode has a reduced number of electrical interference centres which generate microscopic electric potential differences, field strength maxima or microscopically different reaction capabilities at the electrode surface and

wherein the at least one ablation or mapping electrode has an electrolytically treated surface.
2. Catheter according to Claim 1, characterized in that the electrical interference centres, which generate electric signals particularly during the output of high-frequency energy to the at least one ablation or mapping electrode, are essentially arranged on surface regions of the at least one ablation or mapping electrode, and are reduced in their number, areal extent and/or electrical effect.
3. (Previously Amended) Catheter according to Claim 1, characterized in that the at least one ablation or mapping electrode has an electrolytically treated surface.
4. (Previously Amended) Catheter according to Claim 1, characterized in that the at least one ablation or mapping electrode has an electrolytically treated surface which is treated with a solution containing halogen ions, in particular chlorine ions.
5. (Currently Amended) Catheter for the ablation of biological, in particular of animal or human, tissue, preferably for the ablation of human myocardial tissue, having at least one

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ablation or mapping electrode, ~~in particular according to Claim 1,~~ characterized in that

structures of the surface of the at least one ablation or mapping electrode have a rounded

surface structure whose edges or tips have a radius of curvature of more than

approximately 500 nm, with preference of more than 100 nm, and most preferably of

more than 10 nm.

6. (Previously Amended) Catheter according to Claim 1, characterized in that the at least one ablation or mapping electrode comprises a metal whose atoms are present at the surface in a fashion bound at least partially atomically or in an amorphous manner and in an essentially non-crystalline manner.

7. (Previously Amended) Catheter according to Claim 1, characterized in that at least one ablation or mapping electrode comprises platinum.

8. Catheter according to Claim 7, characterized in that the surface of the at least one ablation or mapping electrode is coated at least partially with elementary platinum.

9. (Previously Amended) Catheter according to Claim 1, characterized in that the surface of the at least one ablation or mapping electrode comprises regions with deposited metal present essentially in an amorphous manner or atomically.

10. (Currently Amended) Method for producing a catheter with improved electrical properties, ~~preferably a catheter in accordance with Claim 1,~~ the method comprising the following steps:

~~providing a in the case of which method the catheter~~ which comprises at least one ablation or mapping electrode, ~~characterized in that~~

providing a vessel with a solution which contains ions whose motion can be influenced by an electrical field.

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immersing the at least one ablation or mapping electrode in the solution,

providing a further electrode in contact with the solution,

treating the at least one ablation or mapping electrode, of the catheter, that is to be
~~treated is immersed in a solution which contains ions whose motion can be influenced by~~
~~an electrical field, and by applying an electric voltage is applied between the ablation or~~
~~mapping electrode, of the catheter, that is to be treated and a further electrode in contact~~
~~with the solution.~~

11. Method according to Claim 10, characterized in that the further electrode is an electrode of the catheter.
12. Method according to Claim 10, characterized in that the further electrode is an external electrode.
13. (Previously Amended) Method according to Claim 10, characterized in that the solution contains halogen ions.
14. Method according to Claim 13, characterized in that the solution contains chlorine ions.
15. (Previously Amended) Method according to Claim 10, characterized in that the solution contains NaCl in a range from 0.1 to 100 g/l.
16. Method according to Claim 15, characterized in that the solution contains NaCl in an amount of approximately 7 g/l.
17. (Currently Amended) Method according to Claim 10, ~~characterized in that~~ wherein the solution contains ions of a metal salt.
18. (Previously Amended) Method according to Claim 10, characterized in that the applied voltage is an AC voltage.

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19. Method according to Claim 18, characterized in that the applied AC voltage contains components which have a frequency of more than 0.01 Hz and less than 10 kHz.
20. (Currently Amended) Method according to Claim 18, characterized in that the applied AC voltage contains components which are in a frequency range from 1 to 100 Hz, preferably at 10 Hz.
21. (Previously Amended) Method according to Claim 10, characterized in that the applied AC voltage is in a range from 0.1 to 100 V_{eff}.
22. Method according to Claim 20, characterized in that the applied AC voltage is in a range from 1 to 10 V_{eff}.
23. Method according to Claim 20, characterized in that the applied AC voltage is at 3 to 7 V_{eff}.
24. (Previously Amended) Method according to Claim 10, characterized in that an AC current which generates an AC voltage is impressed on the ablation or mapping electrode and the further electrode.
25. (Currently Amended) Method according to Claim 24, characterized in that the AC voltage has, per ablation or mapping electrode, a current intensity of from 1 mA_{eff} to 1 A_{eff}, preferably from 30 to 100 mA_{eff}.
26. (Currently Amended) Apparatus for catheter treatment, ~~for carrying out a method according to Claim 10,~~ comprising:
a vessel for holding an electrolytic solution and regions of the catheter, ~~as well as, during the conduct of the catheter treatment,~~ an electrolytic solution in the vessel, wherein the ablation or mapping electrode and the further electrode can be wetted by the electrolyte during conducting of the catheter treatment,

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a voltage-generating or current-generating unit, and

a connection device for connecting at least one ablation or mapping electrode of the catheter and a further electrode to the a voltage-generating or current-generating unit, ~~in the case of which apparatus the ablation or mapping electrode and the further electrode can be wetted by the electrolyte during the conduct of the treatment.~~

27. (Currently Amended) Apparatus for catheter treatment according to Claim 26, ~~in the case of which~~ wherein the voltage-generating or current-generating unit is comprises an internal unit mechanically connected to the vessel.

28. (Currently Amended) Apparatus for catheter treatment according to Claim 26, ~~in the case of which~~ wherein the voltage-generating or current-generating unit is comprises an external unit not mechanically connected to the vessel.

29. (Previously Amended) Catheter for the ablation of biological, in particular of animal or human, tissue, preferably for the ablation of human myocardial tissue, having at least one ablation or mapping electrode, characterized by being produced or treated in accordance with a method according to Claim 10.